

# **New Hampshire's Application for Relief from Federally Preempted Gasoline Standards**

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Prepared by

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Department of Environmental Services



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## **1. INTRODUCTION**

New Hampshire adopted a rule on October 29, 2001 to regulate air pollution performance standards for gasoline supplied to areas presently designated as nonattainment for the National Ambient Air Quality Standard (NAAQS) for ground level ozone. This rule is referred to as the Oxygen Flexible Reformulated Gasoline (OFRFG) rule.<sup>1</sup> With this application for relief from federally preempted gasoline standards, New Hampshire is requesting approval from the U.S. Environmental Protection Agency (EPA) to enforce this rule. New Hampshire will also be requesting approval for a revision to the State Implementation Plan (SIP) to replace federal RFG as a VOC control strategy with OFRFG.

New Hampshire opted-in to the federal reformulated gasoline (RFG) program, in a letter from Governor Judd Gregg dated on October 22, 1991, as a volatile organic compound (VOC) control strategy. Beginning in 1995, RFG was required to be supplied in Hillsborough, Merrimack, Rockingham, and Strafford counties (New Hampshire's "four-county area").<sup>2</sup> New Hampshire opted-in to the RFG program to help meet its VOC reduction and State Implementation Plan (SIP) obligations under Section 110 of the federal Clean Air Act (CAA), and to help reach attainment with the one-hour ozone NAAQS. However, because of the federal statutory requirement that RFG contain 2% oxygen by weight and the economics of the available options for meeting this requirement, federal RFG supplied to New Hampshire typically contains five to ten times more methyl tertiary-butyl ether (MTBE) than conventional gasoline.<sup>3</sup> MTBE, when accidentally released into the environment, travels much more readily than other components of gasoline in groundwater. Compounding the problem, MTBE is not broken down (biodegraded) as rapidly as most other components of gasoline. As a result, MTBE represents a greater contamination threat to the state's water resources.

Since the introduction of RFG containing high levels of MTBE, New Hampshire has experienced dramatically increased incidences of MTBE detections in drinking water and other water resources. In response, New Hampshire undertook several steps to diminish the threat of MTBE contamination, leading ultimately to Executive Order 2001-02<sup>4</sup> signed by Governor Jeanne Shaheen in April 2001. This Executive Order instructed the New Hampshire Department of Environmental Services (DES) to "opt-out" of the federal RFG program. Subsequently the New Hampshire General Court passed House Bill 758<sup>5</sup> (signed by Gov. Shaheen on June 26, 2001), which contained language specifically directing DES to pursue an "opt-out" from the federal RFG program. On May 31, 2001,

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<sup>1</sup> The New Hampshire Code of Administrative Rules, Part Env-A 1611 – an interim rule, see <http://www.des.state.nh.us/ard/prpsdrul.htm>.

<sup>2</sup> The four-county area (Hillsborough, Merrimack, Rockingham, and Strafford counties) encompasses all of the State's areas currently designated as nonattainment for the one-hour ozone National Ambient Air Quality Standard.

<sup>3</sup> See the *Study of Reformulated Gasoline Distributed Outside of New Hampshire's Four-County Nonattainment Area*, available on the DES web site, see [http://www.des.state.nh.us/mtbe\\_doclist.htm](http://www.des.state.nh.us/mtbe_doclist.htm).

<sup>4</sup> See <http://webster.state.nh.us/governor/media/eo200102.html>.

<sup>5</sup> See <http://www.gencourt.state.nh.us/legislation/2001/HB0758.html>.

New Hampshire submitted to the U.S. Environmental Protection Agency (EPA) an official petition to opt-out of the federal RFG program.<sup>6</sup>

Under 40 CFR 80.72, EPA is not authorized to approve state petitions to “opt-out” of the RFG program until a demonstration is made that the integrity of the state’s SIP can be maintained without RFG (i.e., through the implementation of other programs which provide equivalent reductions). RFG is relied upon as a control strategy in a number of revisions to New Hampshire’s SIP.

The purpose of this document is to demonstrate that, in lieu of RFG (which is no longer an option in New Hampshire), an enforceable state fuels regulation is necessary to maintain the integrity of New Hampshire’s SIP and to attain the NAAQS for ground level ozone.

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<sup>6</sup> See [http://www.des.state.nh.us/ard\\_intro.htm](http://www.des.state.nh.us/ard_intro.htm), under “What’s New.”

## **2. BACKGROUND**

New Hampshire has four counties which have historically recorded violations of the federal NAAQS for ground level ozone. These four counties are divided into three separate ozone nonattainment areas (i.e., Seacoast and Southern Serious Ozone Nonattainment Areas, and the Manchester Marginal Ozone Nonattainment Area) based on the 1990 consolidated statistical metropolitan area designations and nonattainment classifications established under federal CAA Sections 172 and 181<sup>7</sup> (see Figure 1). New Hampshire is also located within the Ozone Transport Region.<sup>8</sup>

Section 182(b)(1) of the CAA required the state to submit a SIP revision showing that a reduction in VOCs of at least 15% from 1990 base year levels would be achieved based on the federally enforceable programs New Hampshire has in place. New Hampshire's 1996 Rate of Progress (ROP) Plan, (a.k.a. 15% Plan), was approved by EPA on December 7, 1998. In addition, New Hampshire's two serious nonattainment areas were required under Section 182(c)(2) to prepare and submit Reasonable Further Progress plans to demonstrate an additional 3% VOC per year reduction (in addition to 15% by 1996) through the year 1999 (from base year 1990), as well as a demonstration that the SIP provides for attainment of the ozone standard. New Hampshire submitted its Post-1996 Reasonable Further Progress Plan and Ozone Attainment Demonstrations on September 27, 1996 and June 30, 1998 respectively. Table 1 provides a summary and the approval status of New Hampshire programs that rely on federal RFG as a control measure.

As of this date, New Hampshire has satisfied all Section 110 CAA requirements including the submission of a SIP, and all measures contained within the SIP have been implemented. Table 2 shows a wide array of state and federal control programs aimed at reducing emissions of VOCs that have been implemented in New Hampshire. Some, but not all, of these measures were included in New Hampshire's 15% ROP Plan.

Under Section 211(c)(4)(A) of the CAA, states are pre-empted from prescribing or attempting to enforce regulations that control or prohibit any characteristic or component of a fuel or fuel additive. However, Section 211(c)(4)(C) of the CAA authorizes the Administrator of EPA to approve such regulations for individual states upon a finding that the control measure(s) contained in the state's SIP is necessary to achieve attainment with a primary or secondary NAAQS. Specifically, the Administrator may make this finding "... if he finds that the State control or prohibition is necessary to achieve the national primary or secondary ambient air quality standard which the plan implements. The Administrator may find that a State control or prohibition is necessary to achieve that standard if no other measures that would bring about timely attainment exist, or if other measures exist that are technically possible to implement, but are unreasonable or

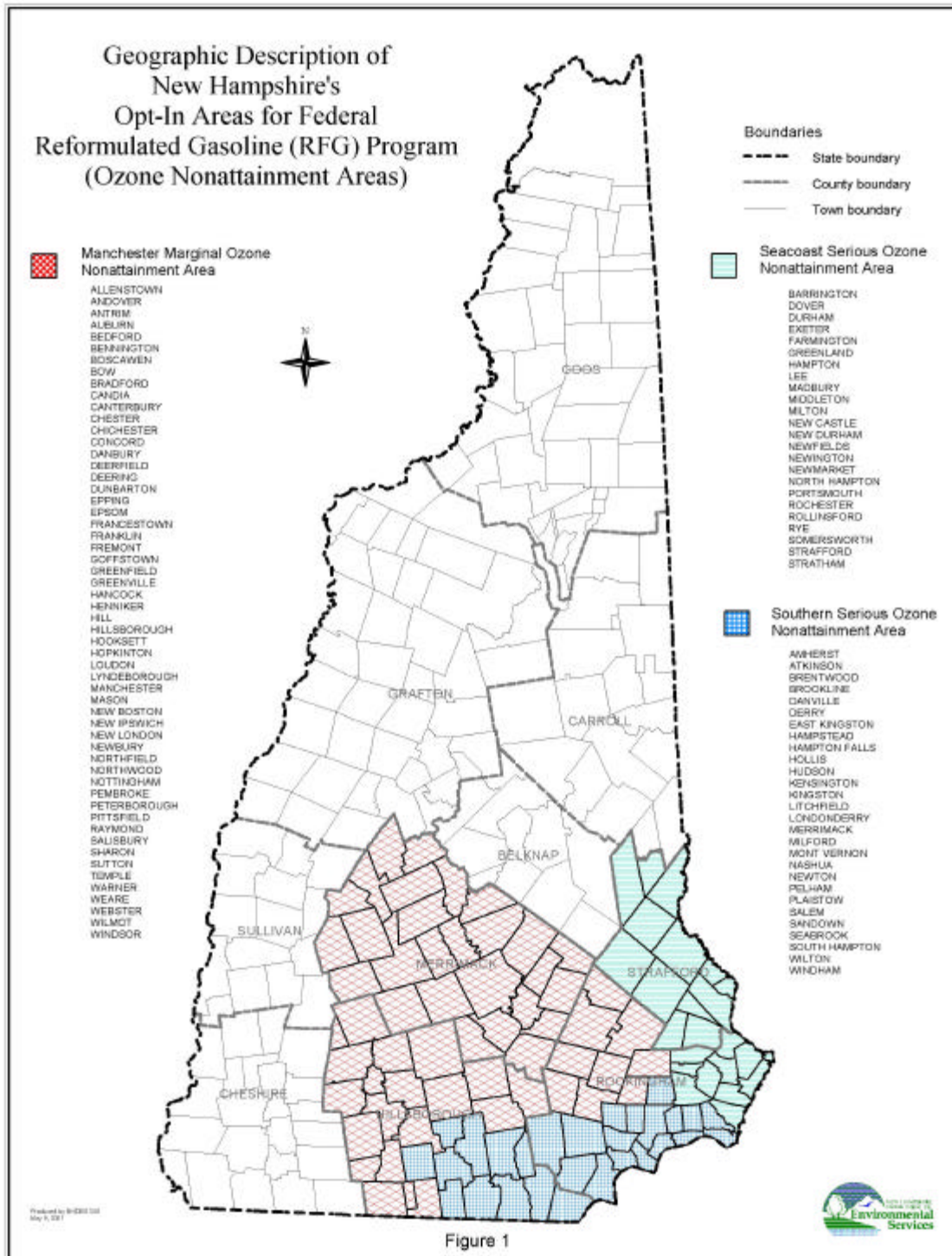
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<sup>7</sup> See <http://www4.law.cornell.edu/uscode/42/7511.html> and <http://www4.law.cornell.edu/uscode/42/7511a.html>. These areas were designated and classified relative to the NAAQS for ozone under Subpart 1 of Title 1 of the federal Clean Air Act (Section 162).

<sup>8</sup> See Section 184 of the federal Clean Air Act.

impracticable. The Administrator may also make a finding of necessity under this subparagraph even if the plan for the area does not contain an approved demonstration of timely attainment.”

**FIGURE 2.1 - New Hampshire's Opt-In Areas for Federal RFG**



**TABLE 2.1 - Revisions to New Hampshire's State Implementation Plan  
Which Rely Upon Federal RFG as a Control Measure**

<b>State Implementation Plan (SIP) Revision</b>	<b>Submission Date</b>	<b>EPA Approval Status</b>	<b>Federal Register Notice</b>
New Hampshire 1996 15% VOC Rate of Progress Plan	Submitted to EPA August 29, 1996	Approved by EPA December 7, 1998	63 FR 67405
New Hampshire Stage II Comparability Analysis	Submitted to EPA April 30, 1998	Approved by EPA September 29, 1999	64 FR 52434
New Hampshire Clean Fuel Vehicles SIP	Submitted to EPA June 7, 1994	Approved by EPA September 29, 1999	64 FR 52434
Carbon Monoxide (CO) SIP Revision Redesignation to Attainment for CO in Manchester, NH	Submitted to EPA December 11, 1998	Approved by EPA November 29, 2000	65 FR 71060
Carbon Monoxide (CO) SIP Revision Redesignation to Attainment for CO in Nashua, NH	Submitted to EPA November 30, 1998	Approved by EPA November 29, 2000	65 FR 71060
New Hampshire Post – 1996 Reasonable Further Progress Plan	Submitted to EPA September 27, 1996	EPA approval is <u>pending</u> . EPA found that the submittal was complete on October 9, 1996. New Hampshire fulfilled its obligations under the Clean Air Act Section 182(c)(2)(B) with the State's submittal on September 27, 1996.	n/a
New Hampshire 2003 Ozone Attainment Demonstration	Phase I submitted to EPA June 2, 1995; found complete by EPA December 2, 1995  Phase II submitted to EPA June 30, 1998	EPA approval is <u>pending</u> . New Hampshire fulfilled its obligations under the Clean Air Act Section 182(c)(2)(A) with the State's submittals on June 2, 1995 and June 30, 1998.	n/a



**Table 2.2 - Summary of State VOC Control Programs**

<b>State VOC Control Programs</b>	<b>State Rule Citation</b>	<b>Implementation Date</b>	<b>Last Revision</b>
Stage I Vapor Recovery	Env-A 1205	May 1, 1993	Feb 22, 1996
Stage II Vapor Recovery	Env-A 1205	Nov 1, 1994	Sep 28, 1996
Bulk Terminal VOC Reduction	Env-A 1204.22	undetermined	Aug 31, 1995
Motor Vehicle Enhanced Safety Inspection	Saf-C 3221A	Jan 1, 1999	None
National Low Emitting Vehicle	Env-A 3600	Jan 1, 1999	None
Emulsified Asphalt VOC Restrictions	Env-A 1204.25	Aug 31, 1995	None
Non-CTG VOC RACT	Env-A 1204.05	Jul 1, 1979	Aug 27, 1998
Solvent Degreaser Control	Env-A 1204.26	Jul 1, 1979	Aug 31, 1995
Surface Coating Control	Env-A 803	undetermined	Aug 31, 1995
Rotogravure and Flexography Printing Control	Env-A 1204.18	Jul 1, 1979	Aug 31, 1995

**Table 2.3 - Summary of Federal VOC Control Programs**

<b>Federal Control Programs</b>	<b>Implementation Date</b>
Federal Motor Vehicle Control Program (FMVCP)	Prior to 1990
Fuel Volatility (RVP) Reductions to 9.0 psi	May 1, 1989
Tier I Vehicles (post-1994 Federal Vehicle Standards)	February 19, 1993
Small Engine Standards	Phase I - 1996
Treatment Storage and Disposal Facilities	Phase I - 1996
Architectural and Industrial Maintenance Coatings	1998
Autobody Refinishing	1998
Vehicle Onboard Vapor Recovery Systems (ORVR)	Phase I – 1998
Consumer Products	July 1998
Diesel Truck and Bus Engines	Phase I – 1990 Phase II - 1998
Nonroad Diesel Engines	Phase I – 1996 Phase II - 2007
Lawn and Garden Equipment	Phase I - 1997
Pleasure Craft	Phase I – 1998
Aircraft Standards	1996 - Phase I
Marine Vessels	1998
Vehicle Refueling Onboard Canisters	1998
Federal Reformulated Gasoline (applies to 4 NH counties)	Phase I – 1995 Phase II – 2000
Federal Tier 2 Vehicles/ Gasoline Sulfur Rule	Phase-in starts 2004

### **3. STATE-MANDATED POLICY DIRECTION REGARDING FUEL PROGRAMS**

New Hampshire Governor Jeanne Shaheen signed Executive Order 2001-02<sup>9</sup> on April 16, 2001, which instructed DES to opt-out of the federal RFG program. In addition, New Hampshire's General Court passed House Bill 758<sup>10</sup> (signed by Gov. Shaheen June 26, 2001), which also specifically directed DES to pursue a prompt opt-out from the federal RFG program. Consistent with these directives, on May 30, 2001, the State of New Hampshire petitioned EPA to opt-out of the federal RFG program<sup>11</sup> in an effort to reduce MTBE levels in gasoline supplied to New Hampshire.

Federal RFG has been a critical VOC reduction strategy in New Hampshire's SIP and in demonstrating New Hampshire's ability to reach attainment with the NAAQS for ozone due to its significant VOC and nitrogen oxides (NOx) reductions compared to conventional gasoline. DES estimates that RFG is responsible for approximately 15.6 tons per day of VOC reductions in New Hampshire's four-county area nonattainment.<sup>12</sup>

There are few options available, other than fuel strategies, that provide such significant VOC reductions. To replace the emissions benefits attributed to RFG, New Hampshire has adopted a rule, referred to as the Oxygen-Flexible RFG (OFRFG) rule,<sup>13</sup> which will provide VOC and NOx reductions equivalent to federal RFG, but will not include the minimum oxygen content requirement that the state adopted by reference when it opted into the federal RFG program. Accordingly, the State of New Hampshire seeks relief under section 211(c)(4)(C) of the CAA to establish a state regulation to set performance standards for VOCs for gasoline distributed and sold in the four-county area.<sup>14</sup>

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<sup>9</sup> See <http://webster.state.nh.us/governor/media/eo200102.html>

<sup>10</sup> See <http://www.gencourt.state.nh.us/legislation/2001/HB0758.html>.

<sup>11</sup> See [http://www.des.state.nh.us/ard\\_intro.htm](http://www.des.state.nh.us/ard_intro.htm).

<sup>12</sup> This estimate of VOC reductions from federal RFG in the four-county area is for the year 2002.

Estimated reductions from RFG are a function of vehicle registration mix and vehicle miles traveled, and thus the environmental benefit of RFG varies from year to year.

<sup>13</sup> The New Hampshire Code of Administrative Rules, Part Env-A 1611 – an interim rule, see <http://www.des.state.nh.us/ard/prpsdrul.htm>.

<sup>14</sup> The four-county area in New Hampshire includes Hillsborough, Merrimack, Rockingham, and Strafford counties. These counties are presently designated as nonattainment of the ground level ozone NAAQS. Federal RFG is currently required in the four-county area.

## 4. REQUIREMENTS FOR ALTERNATIVE FUEL SPECIFICATIONS

Since EPA has promulgated federal standards for the specifications of reformulated gasoline (RFG) under sections 211(c) and 211(h) of the CAA, New Hampshire is prohibited from adopting a non-identical state control of fuels under section 211(c)(4). Section 211(c)(4)(A) of the CAA prohibits state regulation of fuel characteristics or components for which EPA has adopted a control or prohibition, unless the state control is identical to the federal control. Under section 211(c)(4)(C), EPA may approve a non-identical state fuel control as a SIP provision, if the state demonstrates that the measure is necessary to achieve the national primary or secondary ambient air quality standard that the plan implements:

“...A State may prescribe and enforce, for purposes of motor vehicle emission control, a control or prohibition respecting the use of a fuel or fuel additive in a motor vehicle or motor vehicle engine if an applicable implementation plan for such State under section 110 so provides. The Administrator may approve such provision in an implementation plan, or promulgate an implementation plan containing such a provision, only if he finds that the State control or prohibition is necessary to achieve the national primary or secondary ambient air quality standard which the plan implements. The Administrator may find that a State control or prohibition is necessary to achieve that standard if no other measures that would bring about timely attainment exist, or if other measures exist and are technically possible to implement, but are unreasonable or impracticable. The Administrator may make a finding of necessity under this subparagraph even if the plan for the area does not contain an approved demonstration of timely attainment.”<sup>15</sup>

### 4.1. Elements Necessary for Relief from Federal Preemption of State Fuels Under Clean Air Act Section 211(c)(4)(C)

For New Hampshire to make its OFRFG rule federally enforceable, the State must apply for relief from federal preemption and submit a SIP revision adopting it as a state fuel control. The State must provide information showing that the measure is necessary in order to provide sufficient VOC reductions to meet the ozone NAAQS based on the statutory requirements for showing necessity.<sup>16</sup> This request for relief must:

- 1) Identify the quantity of reductions needed to reach attainment;
- 2) Identify possible other control measures and the quantity of reductions each would achieve;

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<sup>15</sup> Text of federal Clean Air Act section 211(c)(4)(C), see <http://www4.law.cornell.edu/uscode/42/7545.html>.

<sup>16</sup> See EPA guidance from the Office of Mobile Sources, August 1997, entitled *Guidance On Use Of Opt-In RFG And Low RVP Requirements In Ozone SIPs*, <http://www.epa.gov/otaq/regs/fuels/rvpguide.pdf>.

- 3) Explain in detail, with adequate factual support, which of those identified control measures are considered unreasonable or impracticable; and
- 4) Show that even with the implementation of all reasonable and practicable measures, the state would need additional emissions reductions for timely attainment, and the state fuel measure would supply some or all of such additional reductions.

#### 4.2. Determining Whether Other Measures are Unreasonable or Impracticable

In determining whether ozone control measures are unreasonable or impracticable, reasonableness and practicability are determined in comparison to the state-specific gasoline control program; the issue for New Hampshire is whether these other measure(s) are reasonable and practicable in light of the availability of OFRFG. Some measures may be reasonable and practicable for some areas of the country, but given the advantages of OFRFG, these measures may be comparatively unreasonable or impracticable. Finding another measure unreasonable or impracticable under these criteria would not necessarily imply that the measure would be unreasonable or impracticable for other areas, or even for the same area under different circumstances.

While the basis for finding unreasonableness or impracticability is in part comparative, the state still must provide solid reasons why the other measures are unreasonable or impracticable and must demonstrate these reasons with adequate factual support. Reasons why a measure might be unreasonable or impracticable for a particular area include, but are not limited to, the following:

- 1) Length of time necessary to implement the measure;
- 2) Length of time necessary to achieve ozone reduction benefits;
- 3) Degree of disruption entailed by implementation;
- 4) Other implementation concerns, such as supply issues;
- 5) Costs to industry, consumers or the state;
- 6) Cost-effectiveness; and
- 7) Reliance on commercially unavailable technology.

A strong justification for finding a measure unreasonable or impracticable might rely upon the combination of several of these reasons.

#### 4.3. State Implementation Plan Requirements

Under the requirements of Sections 182 and 184 of the federal Clean Air Act, New Hampshire implemented several VOC and NO<sub>x</sub> control strategies to address nonattainment with the ozone NAAQS. Federal RFG plays a significant role in approved and pending SIP revisions that New Hampshire has filed with EPA in fulfillment of the State's obligations under the CAA (see Table 1). Under the federal regulations for opting-out of the RFG program (40 CFR 80.72), in its petition to opt-out of the RFG program, a State must describe the alternative air quality measures that it plans to use to replace RFG as a control measure.<sup>17</sup> A subsequent SIP revision must then be filed with, and approved by, EPA to make federally enforceable the State's plan to maintain the integrity of the SIP.

To replace federal RFG as a VOC control measure, New Hampshire has adopted rules implementing OFRFG. By definition, OFRFG will provide reductions in VOC emissions equivalent to federal RFG, so no change from the VOC emission reduction values in the existing SIP revisions will occur. OFRFG will be required in the same areas of New Hampshire that federal RFG is currently required (i.e., Hillsborough, Merrimack, Rockingham, and Strafford counties). Upon final adoption of its OFRFG rules, New Hampshire will submit corresponding modifications to these currently approved SIP revisions.

#### 4.4. Compliance Strategy

New Hampshire has developed a compliance strategy to ensure that the gasoline being delivered to New Hampshire's four southeastern counties is meeting the specifications of the OFRFG rule. Because the OFRFG rule relies on performance standards that are much the same as federal RFG, the compliance strategy consists of the screening and laboratory analysis of gasoline samples for data inputs to the Complex Model for determination of compliance with New Hampshire's OFRFG rule.

Gasoline certified as Phase II federal RFG is a compliant fuel, and documentation of that certification will suffice as evidence of compliance. New Hampshire's DES will have the authority to require gasoline distributors and/or retailers to provide adequate information on their gasoline to provide the necessary inputs to the Complex Model to determine compliance. New Hampshire's compliance strategy will be detailed in a SIP revision requesting approval of OFRFG as a SIP control measure to help attain and maintain the federal NAAQS for ground level ozone.

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<sup>17</sup> Taken from 40 CFR 80.72(b)(3)(ii).

## **5. ANALYSIS OF SOURCE CATEGORIES AND POTENTIAL ADDITIONAL REDUCTIONS**

In Tables 5.1, 5.2, and 5.3 (found on pages 27-30) and the following discussion, DES has analyzed its 1996 emissions inventory for potential additional control strategies and emissions reductions for Hillsborough, Merrimack, Rockingham, and Strafford counties. As discussed in the previous section, opting-out of the federal reformulated gasoline program will require the implementation of new control programs or enhancements to existing programs. The following analysis utilizes DES's most recent (1996) periodic inventory. While growth factors vary between sectors, it is highly unlikely any positive (or negative) growth in emissions between 1996 and 2002 would fundamentally change this analysis. For the sake of this analysis, a conservative assumption (reflecting a high annual growth factor of 2%) was applied to potential additional VOC reductions from 1996 to 2002.

### **5.1. Point Sources**

Point or stationary sources are conventional sources typically referenced in relation to emissions from larger commercial and industrial facilities such as factories, power plants, etc. This section discusses the potential for reductions from these sources and is summarized in Table 5.1 on page 27.

#### **5.1.1. Stationary Sources**

Stationary point source VOC emissions in Hillsborough, Merrimack, Rockingham, and Strafford counties totaled an estimated 10.221 tons per summer weekday (tpswd) after control in 1996. Point sources in New Hampshire are subject to a variety of VOC control requirements including the DES's Env-A 803, *VOC Testing*; Env-A 1204.05, *RACT Order Application and Issuance Procedures*,<sup>18</sup> Env-A 1204.10, *Applicability Criteria and Compliance Standards for Coating of Paper, Fabric, Film and Foil Substrates*; Env-A 1204.18, *Applicability Criteria and Compliance Standards for Rotogravure and Flexographic Printing*; Env-A 1204.20, *Applicability Criteria and Compliance Standards for Fixed-Roof Tank VOL Storage*; Env-A 1204.22, *Applicability Criteria and Compliance Standards for Bulk Gasoline Loading Terminals*; and Env-A 1204.26, *Applicability Criteria and Compliance Standards for Solvent Metal Cleaning*.

DES has identified one measure that might provide additional VOC emission reductions from point sources, namely reducing the major source and Env-A 1204.05 non-CTG VOC RACT applicability threshold from 50 to 10 tons per year of actual emissions. DES estimates that reducing the applicability threshold for Env-A 1204.05 to 10 tons per year or greater actual emissions would provide only an additional 0.057 tpswd in reductions in 2002.

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<sup>18</sup> Non-CTG (Control Techniques Guidelines) VOC RACT (Reasonably Available Control Technology).

If implemented, this strategy would provide minimal additional VOC reductions. In addition, before these controls could be implemented, DES would need to undertake an assessment of their actual emission reductions along with the costs and potential impacts on the regulated community. It is highly unlikely that DES could complete such an assessment and implement new regulations before the 2002 ozone season. Additional stationary source controls are not a practicable alternative to an OFRFG regulation.

#### 5.1.2. Publicly Owned Treatment Works (POTWs)

In 1996, the estimated emissions for the POTW source category in New Hampshire were estimated at 0.306 tpswd. VOC emissions from major source POTW and industrial wastewater facilities are currently covered under DES's Env-A 1204.05, *RACT Order Application and Issuance Procedures*. EPA has drafted an Industrial Waste Water (IWW) CTG (EPA-453/D93-056) that cites the ability to reduce VOC emission reductions by as much as 99% in a cost-effective manner at IWW facilities with facility-wide VOC loadings greater than 11 tons per year and individual wastewater streams containing VOC concentrations of 10,000 parts per million by weight, or if a stream has total flow greater than 1 liter per minute and VOC concentrations greater than 500 parts per million by weight. Many of the control options discussed in the CTG, such as steam stripping or the reduction of upstream discharges may also be cost-effectively applied to similar sized POTW facilities. Utilizing the STAPPA/ALAPCO publication "*Meeting the 15-Percent Rate-of-Progress Requirement Under the Clean Air Act: A Menu of Options*," DES estimated the application of additional controls on this source category could provide an additional 0.241 tpswd in emissions reductions in 2002.

Before these controls could be implemented, however, DES would need to undertake an assessment of actual POTW emissions. States that have used an emission estimation model have found that emissions from POTWs were considerably lower than the estimates provided by the national emission factor used by New Hampshire and most other states. Alternatively, the South Coast Air Quality Management District (California) requires emissions testing and quantification at POTW facilities. In addition to better quantifying actual emissions, DES would also need to fully assess the economic impact of such controls on municipalities, and the length of time needed to implement these controls. Because of inventory questions, potential impacts on municipalities, and the length of time necessary to implement these controls, this strategy does not represent a reasonable and practicable alternative to an OFRFG regulation.

#### 5.1.3. Treatment, Storage and Disposal Facilities (TSDFs)

New Hampshire does not have any emissions from treatment, storage and disposal facilities, therefore there are no additional reductions that can be made within this source category as a practicable or reasonable alternative to an OFRFG regulation.



#### 5.1.4. Landfills

Landfill emissions for 1996 were estimated at 1.183 tpswd. In 1996, EPA published New Source Performance Standards (NSPS) and Emissions Guidelines (EG) requiring landfills with a design capacity of 2.5 million megagrams (Mg) or greater and non-methane organic compound (NMOC) emissions greater than 50 Mg/year to install gas collection and control systems. Similar controls have been required on smaller landfills in several areas of California. For example, the Sacramento Air Quality Control District requires landfills with greater than 500,000 tons of waste to install gas collection and control systems.

There are currently four landfill facilities within the four-county region in southern New Hampshire that are larger than 2.5 million Mg (or 2.5 million cubic meters). All of these facilities have installed off-gas collection systems installed along with either a flare or LFG/Diesel generation systems. DES estimates that approximately 80% of the landfill off-gas is collected and about 98% of that amount is destroyed in the subsequent combustion process. Due to the high destruction efficiency of combustion processes, the only remaining option for further reducing VOC emissions from the four landfills is to raise the collection efficiency of the off-gas collection systems to greater than 80%. To do this would require major reconstruction of the collection systems, potentially requiring extensive modifications to the landfill itself in the form of changing liners and ventilation collectors. Because of the low potential for substantial VOC reductions (<0.23 tpswd), this strategy is not considered a reasonable or practicable alternative to the OFRFG regulation.

#### 5.2. Area Sources

Area sources are sources that individually may contribute very small amounts of pollution, but when considered in aggregate, due to the large number of individual sources, may emit significant volumes. Typical area sources would include gas stations, dry cleaners, consumer products (e.g., deodorant, hair spray, etc.), coating operations (e.g., auto refinishing), etc. This section discusses the potential for reductions from these sources and is summarized in Table 5.2 on page 28.

##### 5.2.1. Gasoline/Fuel Distribution

###### 5.2.1.1. Tank Truck Unloading (Stage I)

Tank truck unloading activities accounted for 1.431 tpswd of VOC emissions in Hillsborough, Merrimack, Rockingham, and Strafford counties in 1996. Any gasoline dispensing facility whose tank capacity exceeds 1100 gallons is subject to the Stage I requirements of DES's Env-A 1205.04(a)(2) Applicability of Stage I Requirements to Gasoline Dispensing Facilities regulation. These facilities were required, by November 1, 1994, to install and to operate a Stage I vapor control

system that will eliminate “splash” filling through submerged fill pipes that introduce gas to the bottom of the tank. Displaced fumes from the filled tank are then transferred through a sealed closed loop into the tank truck rather than released into the air. As a result of instituting these controls, 98.6% of the gasoline unloaded in these counties was subject to Stage I requirements in 1996. While the default rule effectiveness of Stage I programs is assumed to be 84%, New Hampshire has instituted a more aggressive compliance and enforcement program for Stage I, increasing the rule effectiveness to 90%. No additional significant emission reductions are available from this source category.

#### 5.2.1.2. Vehicle Refueling

Vehicle refueling and associated spillage accounted for an estimated 1.669 tpswd of VOC emissions in 1996, after accounting for the application of Stage II vapor recovery controls and the use of federal reformulated gasoline. Stage II vapor recovery systems are currently required on all gasoline dispensing facilities with an annual throughput of 420,000 gallons or greater per year per the New Hampshire Code of Administrative Rules Part Env-A 1205.19, *Applicability of Stage II Requirements*.<sup>19</sup> In 1996, the 420,000 gallon per year threshold represented Stage II controls on 84% of gasoline sales in the four-county area. DES estimates that extending the Stage II vapor control requirement to all service stations in the four-county nonattainment area would provide increased reductions of 0.038 tpswd.

Env-A 1205.19 would need to be amended in order to revise applicability to include all refueling stations. The rulemaking process generally takes at least six months to a year, and this type of rule change would require a reasonable lead time for affected facilities, most likely on the order of two years. Thus, it would not be possible to complete rulemaking before the beginning of the 2002 ozone season. In addition, about half of the gasoline dispensing facilities in the covered area (the four-county area) are currently exempt from Stage II requirements because their annual throughputs do not meet the threshold for implementation. However, roughly 85% of all gasoline distributed in the four-county area is subject to Stage II controls under the current annual threshold (420,000 gallons). In addition to problems regarding the timeliness of implementation, the costs to smaller facilities not currently subject to the rule (i.e., \$10K - \$25K per facility) makes the strategy of changing Env-A 1205 to reduce the number of exempt facilities an impracticable measure for achieving emission reductions.

#### 5.2.1.3. Underground Tank Breathing

Underground storage tanks at gasoline service stations are required by fire code to be vented. Stage I vapor recovery devices limit emissions from these vents by channeling displacement vapors into the delivery truck during loading, but

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<sup>19</sup> See <http://www.des.state.nh.us/ard/enva1200.htm>.

emissions can still occur from the vents due to diurnal temperature and barometric pressure changes, and when pressure equalization occurs between delivery trucks and the underground tanks. Pressure/vacuum (P/V) vent valves can be installed on underground storage tank vent lines to maintain pressure within the tank. Such P/V vents have been in use for many years, and are available from several manufacturers. New Hampshire's Stage I rule contains a P/V valve requirement, as does the California BAQMD Regulation 8-Rule 7 and the SCAQMB Rule 461. Installation of P/V valves can achieve virtually a 100% control efficiency, and is cost-effective. DES has estimated that eliminating all underground storage tank breathing throughout the four-county area would yield an additional 0.229 tpswd reduction. Unfortunately, retrofitting all underground storage tanks with P/V vents will take some time, and it is not reasonable to expect that DES could promulgate regulations for this control strategy and have these controls in place before the start of the 2002 ozone season.

#### 5.2.1.4. Leaking Underground Storage Tanks

The emissions from remediation of leaking underground storage tanks were estimated at 0.036 tpswd in 1996. Since New Hampshire currently has a compliance rate with federal underground storage tank removal and replacement requirements of more than 99%, current emissions from this source category are already considerably below the 1996 estimate. There is little if any opportunity for additional emission reductions from this source category<sup>20</sup> since the only effective control strategy (i.e., tank removal and replacement) is already nearly complete.

#### 5.2.1.5. Tank Trucks in Transit

This source category accounted for 0.203 tpswd of emissions in 1996. Since tank trucks state-wide are already subject to the Stage I tank truck tightness requirements of DES's Env-A 1205, *Volatile Organic Compounds (VOC): Gasoline Dispensing Facilities and Cargo Trucks*, there is no potential for additional emission reductions from this source category.

#### 5.2.1.6. Petroleum Vessel Unloading

Petroleum or marine vessel unloading operations accounted for only a small, unspecified amount of VOC emissions in 1996. Although New Hampshire does not have any petroleum refining facilities, petroleum unloading terminals in Newington (Rockingham county) handle petroleum products for local use. This system is already controlled within a closed system under current VOC RACT requirements.<sup>21</sup> Petroleum products from vessels are removed via pipeline to several floating top storage tanks. As a result, the only VOC emissions from

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<sup>20</sup> The total emissions from this category in 1996 were 0.05 tpswd.

<sup>21</sup> See <http://www.des.state.nh.us/ard/enva1200.htm>.

unloading procedures come from occasional accidental spillage. Thus, adopting stricter controls for this source category does not represent a practicable or reasonable alternative to an OFRFG regulation.

#### 5.2.1.7. Aircraft Refueling

Aircraft refueling procedures at airports utilize a primarily closed system in which there is minimal atmospheric exposure, thus volatilization is minimal. Emissions from refueling procedures are limited primarily to spillage. Emissions from refueling vehicles and other ground support equipment are included in the Off-Road emissions category. There are no additional practicable controls for reducing emissions from aircraft refueling procedures.

#### 5.2.2. Stationary Fuel Use

This source category includes all small stationary source users of fuel, and was responsible for 0.096 tpswd of VOC emissions in 1996. There are no practicable controls for additional emission reductions from this source category.

#### 5.2.3. Open Burning and On-Site (Home) Incineration

Open burning and incineration emissions during 1996 were estimated to total 1.274 tpswd. While the New Hampshire Legislature recently enacted additional prohibitions against the commercial open burning of materials other than wood, agricultural, forestry and solid or liquid fuel (RSA 125-C:4 and Env-A 1001, the emission reductions attributable to these restrictions are difficult to quantify. In 2001, the New Hampshire Legislature voted to additionally prohibit the open burning of residential trash in the vast majority of New Hampshire towns<sup>22</sup>. There is no potential for additional emission reductions from this source category.

#### 5.2.4. Catastrophic and Accidental Releases

Catastrophic and accidental releases from oil spills and transportation accidents were responsible for a small and unspecified amount of emissions in 1996. Since these emissions are the result of accidents and catastrophic events, there is no opportunity for additional emission reductions from these sources.

#### 5.2.5. Stationary Area Source Solvent Use

##### 5.2.5.1. Dry Cleaning

The vast majority of drycleaners in New Hampshire use perchloroethylene (PERC) as their cleaning agent, which has been classified as an exempt solvent by EPA.

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<sup>22</sup> NH House Bill 274 (2001 Chapter Law 285), signed July 16, 2001 (See <http://gencourt.state.nh.us/legislation/2001/HB0274.html>)

Therefore, there are no additional reductions available from the area source dry cleaning category. There are two dry cleaners that use other solvents that are not exempt, and they are included in the point source category. These sources are subject to MACT standards, which require enclosure and solvent recycling, so no additional reductions can be achieved from these sources.

#### 5.2.5.2. Surface Cleaning

The surface cleaning category includes four subcategories:

1. Automobile Repair;
2. Manufacturing;
3. Electronics; and
4. Miscellaneous

Total surface cleaning emissions in 1996 from these four subcategories totaled 4.676 tpswd, before accounting for controls. Surface cleaning emissions in New Hampshire are currently controlled under DES's Env-A 1204.26 *Applicability Criteria and Compliance Standards for Solvent Metal Cleaning* regulation, which controls VOC emissions from all new and existing solvent degreasers including cold cleaning degreasers, open-top vapor degreasers and conveyORIZED degreasers. Based on EPA guidance, DES has ascribed a control effectiveness of 20% to this area source category.

Additional reductions may be obtained from this source category through the use of alternative solvents, alternative cleaning processes and no-clean technologies. The use of alternative solvents is currently considered the most practicable option, and can result in emissions reductions of as much as 100% when aqueous solvents can be utilized. The prohibition of non-aqueous solvents would provide as much as an additional 5.266 tpswd<sup>23</sup> in emissions reductions in 2002 for the four-county area. The prohibition of non-aqueous cleaners would require significant process changes, however, so DES would need to study its effects on the regulated community, in particular specialty manufacturers such as the aerospace industry. Therefore, DES does not believe that the prohibition of non-aqueous surface cleaners is a practicable or reasonable alternative to an OFRFG regulation, particularly for the summer of 2002.

#### 5.2.5.3. Surface Coatings

The surface coating category had estimated total emissions of 11.253 tpswd in 1996, before accounting for controls. It includes ten subcategories:

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<sup>23</sup> This emissions reduction estimate is grown out from 1996 Periodic Emissions Inventory numbers at a rate of two% per year.

1. Automobile Refinishing;
2. Traffic Markings;
3. Furniture and Fixtures;
4. Machinery and Equipment
5. Other Transportation Equipment;
6. Factory Finished Wood;
7. Architectural Coatings;
8. Other Production Coatings;
9. High Performance Maintenance Coatings; and
10. Other Specialty Coatings.

Emissions from a number of these surface coating subcategories are currently being controlled by either state or federal programs:

Automobile Refinishing. Automobile refinishing operations were estimated to emit 2.592 tpswd of VOC emissions in 1996. In 1998, EPA published final regulations for the control of automobile refinishing emissions (40 CFR Part 59 Subpart B). This regulation established a number of emissions limits for automobile refinishing coatings and solvents, and established work practices designed to minimize VOC emissions. This rule is expected to reduce VOC emissions by approximately 0.959<sup>24</sup> tpswd. Several air pollution control agencies have adopted more stringent standards for this source category. For example, Massachusetts requires all coatings to be applied with high efficiency application equipment such as high volume low pressure (HVLP) or electrostatic application equipment. In California, the Sacramento Air Quality Management District has adopted more stringent VOC limits for a number of primers and topcoats. DES has estimated the potential benefits from adopting the South Coast Air Quality Management District surface preparation products VOC limit of 0.58 lbs/gal to be 2.592 tpswd. Adopting a requirement for HVLP or electrostatic spray equipment would provide an additional 1.347 tpswd in emissions reductions. While both high efficiency application equipment and more stringent VOC content limits might represent viable strategies for achieving additional emission reductions in the long-term, each has significant obstacles to near-term implementation. A requirement for automobile refinishing operations to utilize high efficiency application equipment will need to be accompanied by a significant lead-time, so sources are able to purchase and install this equipment. Requirements for more stringent emission limits on coatings could cause significant supply disruptions for New Hampshire sources, because these coatings may not be widely distributed on the east coast. Adoption of more stringent emission standards for autobody refinishing is an impracticable and unreasonable alternative to an OFRFG regulation for the 2002 ozone season.

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<sup>24</sup> Based on a 37% reduction applied to the 2.592 tpswd 1996 inventory.

Traffic Markings. Traffic marking emissions in Hillsborough, Merrimack, Rockingham, and Strafford counties in 1996 were estimated to be no greater than 0.465 tpswd (assuming traffic marking emissions comprise all of the difference between automotive refinishing emissions and small industrial emissions) before accounting for controls. While a number of air pollution control agencies have adopted regulations limiting the VOC content of traffic paint to 250 g/l, and other states have been voluntarily using paints with VOC contents of approximately 120 g/l, DES would need to undertake a detailed analysis of current emission levels, potential for additional emission reductions, costs and other factors before adopting more stringent limits for this source category. Additional emission reductions from this source category are therefore impracticable and unreasonable for the 2002 ozone season.

Furniture and Fixtures, Factory Finished Wood, Machinery and Equipment, Other Transportation Equipment and Other Product Coatings. Emissions from these sources are currently being controlled through DES's Env-A 803, *VOC Testing* regulation, which requires sources to control their VOC emissions through the application of add-on control technology, low-VOC coatings, or meeting a daily-weighted average emission limitation. Emissions from aerospace manufacturing and rework facilities, ship repair, and wood furniture manufacturing facilities are controlled under the applicable federal maximum available control technology (MACT) emission limitation. Additional, but currently unquantified, reductions might be obtained from these source categories through the implementation of more stringent VOC emissions limits, increased requirements for add-on control technology, and lowered source applicability thresholds. A detailed analysis of current emission levels, potential for additional emission reductions, costs and other factors would be necessary before additional controls could be proposed for these source categories, so this measure is not a practicable alternative to an OFRFG regulation.

Architectural Coatings, High Performance Maintenance Coatings, Other Specialty Coatings. These sources are currently subject to the federal Architectural and Industrial Maintenance (AIM) Coatings regulation of August 14, 1998, which established VOC emissions limits for 55 categories of coatings. The federal AIM rule purportedly reduces VOC emissions from these categories by approximately 20%. Several states have adopted AIM rules with emission limits that are more stringent and cover more source categories than the federal rule. The South Coast Air Quality Management District's current AIM regulation provides a 28% reduction in VOC emissions, while STAPPA/ALAPCO has developed several proposals that would provide additional reductions above and beyond the federal rule. The most stringent of these, proposed for 2002, would provide a 41% reduction in VOC emissions.

DES has estimated that adoption of the current South Coast Air Quality Management District AIM coatings limits would provide an additional 0.694 tpswd reduction. Unfortunately, DES believes that the adoption of more stringent VOC content limits and/or additional coating categories in New Hampshire could result in significant supply disruptions and cost increases due to the small market for these goods. Before additional controls can be proposed for these source categories, DES would need to undertake a detailed analysis of current emission levels, potential for additional emission reductions, costs and other factors. Adoption of more stringent AIM requirements in the short term is thus neither a practicable nor reasonable alternative to an OFRFG regulation.

#### 5.2.5.4. Graphic Arts

This source category includes rotogravure and flexographic printing and offset lithography processes. The graphic arts source category was responsible for emissions of 1.983 tpswd in 1996, before accounting for controls. Rotogravure and flexographic printing sources with maximum theoretical emissions of 50 tons per year or more are currently controlled under DES's Env-A 1204.18, *Applicability Criteria and Compliance Standards for Rotogravure and Flexographic Printing* regulation. Extending this regulation's applicability to offset lithography printing processes and requiring all sources to utilize either add-on controls or low-VOC inks providing at least a 70% reduction in emissions would provide overall source category reductions of approximately 1.563 tpswd. While DES believes that this level of control is technically feasible, the cost-effectiveness and impacts on the regulated community are currently unknown. Additional controls on this source category are therefore not a reasonable, timely, or practicable alternative to an OFRFG regulation.

#### 5.2.5.5. Asphalt Paving.

DES currently regulates emissions from asphalt paving through the New Hampshire Code of Administrative Rules, Part Env-A 1204.25, *Applicability Criteria and Compliance Standards for Cutback and Emulsified Asphalt* regulation.<sup>25</sup> This rule prevents the use of cutback asphalt (i.e., asphalt liquefied with petroleum distillate, a VOC) during the ozone season, but does provide for several exemptions. Adopting the limits contained within California's South Coast Air Quality Management District (SCAQMD) Rule 1108<sup>26</sup> would provide no additional VOC reductions since cutback asphalt has been eliminated in southern New Hampshire.

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<sup>25</sup> See <http://www.des.state.nh.us/ard/enva1200.htm>.

<sup>26</sup> SCAQMD Rule 1108 specifies that cutback asphalt can contain no more than 0.5% by volume organic compounds which evaporates at 500°F or lower as determined by ASDTM-D-402.



#### 5.2.5.6. Pesticides

The pesticides source category had estimated emissions of 0.696 tpswd in 1996. Pesticide use in southern New Hampshire is limited as there is relatively little agricultural activity in these counties. While reductions from control measures such as reformulation of pesticides; reducing fumigant usage, using alternative application methods, applying microencapsulation techniques, and using integrated pest management<sup>27</sup> may be possible, emissions controls for this source category would require further study before implementation. There are widely varying estimates of the potential emissions reductions from this source category, with reduced-volume spraying and integrated pest management reducing pesticide use by 33 to 67%. Assuming a 50% reduction in pesticide use and/or VOC content, controls on this source category could provide an additional 0.392 tpswd in emissions reductions. The significant cost, supply and industry disruption associated with controls on this source category make implementation impracticable and unreasonable for the 2002 ozone season.

#### 5.2.5.7. Consumer and Commercial Solvent Use

The 1996 estimated emissions from the consumer and commercial products category was 6.414 tpswd. The consumer products subcategory is currently being controlled through the federal consumer products rule (40 CFR Parts 9 and 59), which provides a 12.5% reduction in VOCs from the twenty-four regulated categories of consumer products including, air fresheners, antiperspirants and deodorants, engine degreasers, floor polish/waxes, hair sprays and insecticides. Stricter VOC emission limits patterned after those adopted by the California Air Resources Board would provide significant additional emission reductions. In addition to more stringent limits on many of the products covered under the federal rule, the California consumer products regulation addresses seven additional product categories, and would provide about a 28% reduction in the total consumer and commercial products inventory, or an additional 1.770 tpswd.

Although adoption of these more stringent consumer products limits would provide significant additional reductions, this is not a practicable option for several reasons. First and foremost, since most consumer and commercial products are centrally distributed within broad regional markets (e.g., via Boston, New York City, etc.), more stringent product limits applicable only to New Hampshire could result in severe restrictions on availability, and thus, on consumer choice. Even if New Hampshire were able to promulgate regulations requiring manufacturers to meet these standards by the 2002 ozone season, it would be difficult to secure the cooperation of manufacturers and distributors in such a compressed timeframe over such a small market and to the likely detriment of their customers. Adoption of the California Air Resources Board's consumer

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<sup>27</sup> These methods are described in the EPA Alternative Control Techniques document entitled "*Control of VOC Emissions from the Application of Agricultural Pesticides*" (EPA-453/R-92-011).

products limits for one small state market is not a practicable or reasonable alternative to an OFRFG regulation.

#### 5.2.6. Bioprocess Emission Sources

##### 5.2.6.1. Bakeries

Bakery emissions from smaller, unlicensed sources were estimated at 0.041 tpswd in 1996. VOC emissions at bakeries can be controlled through a variety of measures, including thermal incinerators or carbon adsorption units. EPA has published an Alternative Control Techniques document for bakery oven emissions (EPA-453/R-92-017) which indicates that it may be cost-effective to control emissions from smaller bakeries. EPA estimates that catalytic oxidation would cost approximately \$2500/ton at certain bakeries with emissions of 25 tons per year, and \$2300/ton at certain 16 ton per year bakeries. In addition, the southern California South Coast Air Quality Management District has already adopted regulations to control the emissions from bakery ovens with a rated heat input capacity of 2 million BTU per hour or more and having daily emissions of 50 pounds of VOC or more. The length of time necessary to promulgate and implement controls on smaller bakeries, in combination with their very low uncontrolled emissions, makes further regulation of this source category impracticable and unreasonable.

#### 5.2.7. Other Stationary Area Sources

##### 5.2.7.1. Forest Fires

Total emission from forest fires in 1996 were not estimated by DES, but were expected to be small. Since New Hampshire already has an aggressive forest fire control program, additional emission reductions from this source category are impracticable and unreasonable.

##### 5.2.7.2. Structure Fires

Structure fire emissions were estimated at 0.115 tpswd for 1996. Since structure fires are predominately accidental in nature, there is no potential for additional emission controls on this source category.

#### 5.3. Mobile Sources

Mobile sources are non-stationary sources of pollution including onroad vehicles (cars, trucks, etc.) and nonroad sources such as planes, trains, and lawn/garden equipment. This section discusses the potential for reductions from these sources and is summarized in Table 5.3 on page 30.

### 5.3.1. Highway Mobile Sources

Highway mobile sources in Hillsborough, Merrimack, Rockingham, and Strafford counties were responsible for 44.890 tpswd of emissions in 1996, before accounting for controls. Highway mobile source emissions in 1996 were controlled by several programs, including the pre-1990 Federal Motor Vehicle Control Program, Post 1990 Motor Vehicle Emissions Standards (Tier 1), and the federal reformulated gasoline program.

There are a number of control strategies and programs that could provide additional mobile source emissions reductions, including:

#### 5.3.1.1. Vehicle Inspection and Maintenance Programs

Enhanced motor vehicle inspection and maintenance (I/M) programs have the potential to provide significant VOC and NO<sub>x</sub> emissions reductions from the mobile source sector. However, implementation of an enhanced I/M program in southern New Hampshire is not an option under the current direction of the New Hampshire Legislature. HB 1513,<sup>28</sup> passed and signed into law on May 21, 1998, repealed the state statute authorizing an enhanced I/M program in New Hampshire.

An Enhanced Safety Inspection Program (ESIP) was implemented in Hillsborough, Merrimack, Rockingham, and Strafford counties beginning January 1, 1999. The program incorporates a visual inspection of the catalytic converter and certain other emissions-related components in conjunction with the annual state safety inspection. Reductions for this program are estimated at 0.64 tpswd in 2003. Future plans include requirements for inspection and necessary repairs as indicated by the On-Board Diagnostic (OBD) II system beginning in 2003. Reductions from implementation of OBD are difficult to quantify as it is a preventative program as opposed to a traditional I/M test and repair program, but are assumed to be equal or greater than the ESIP. Emission reduction credits from either part of the enhanced safety inspection program are not sufficient to make I/M a practicable alternative to an OFRFG regulation.

#### 5.3.1.2. Low Emission Vehicles

New Hampshire adopted regulations incorporating the National Low Emission Vehicle (NLEV) program requirements in 1999. NLEV is a federally enforceable, voluntary agreement between the state and automobile manufacturers to provide low emission vehicles in the state. This program took effect with the 2001 vehicle model year. While the NLEV program will provide significant emission reductions, program benefits are dependent upon fleet turnover, or the

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<sup>28</sup> See <http://www.gencourt.state.nh.us/legislation/1998/HB1513.html>.

replacement of existing vehicles with new, cleaner cars and trucks. New Hampshire is legally committed to the NLEV program through the 2006 model year and thus additional reductions are not available from this sector.

#### 5.3.1.3. Transportation Control Measures

Transportation control measures (TCMs) currently implemented or under consideration in New Hampshire have not yielded significant emission reductions, in part due to New Hampshire's low population density. These strategies generally work better in urban areas with large population centers. TCMs, like park-and-rides, can be effective in more urban settings, but there are relatively few (beyond those already implemented) that would be practical or cost effective in New Hampshire, where a significant part of the state is rural in nature. Ridesharing is used quite effectively in several population centers located in the southern part of the state, but even this measure has only a limited application because public transportation is not readily available in many areas. The increased use of TCMs is therefore not a practicable or reasonable alternative to an OFRFG regulation.

#### 5.3.1.4. Voluntary Measures for Mobile Sources

On October 23, 1997, EPA released guidance on voluntary measures for mobile sources. Pursuant to this guidance, these measures must be part of the State Implementation Plan (SIP) in order for the State to take credit for the programs, necessitating a formal rulemaking process for any proposal. Further, these measures are limited to 3% of the total reductions needed for attainment in an area. While there are several voluntary measures available for use, there is not enough time to incorporate these measures into the SIP before the beginning of the 2002 ozone season. In addition, due to the rural nature of the State, these measures do not provide enough reductions to serve as an effective and practicable replacement for an OFRFG regulation.

### 5.3.2. Nonroad Mobile Sources

Nonroad mobile sources under this category are currently being controlled under a number of federally-implemented programs, and states are pre-empted from implementing additional controls on these sources. These source categories include:

#### 5.3.2.1. Nonroad Engines or Vehicles

Nonroad emissions accounted for 15.970 tpswd in 1996. On July 3, 1995, EPA promulgated regulations establishing emission standards for new nonroad gasoline engines at or below 19 kilowatts effective for the 1997 model year. This

category includes lawn and garden equipment, outdoor power equipment, recreational equipment, construction equipment, farm equipment and marine vessels. Annual emissions reductions from this program will increase greatly in the first few years, then level off as product and/or fleet turnover is achieved. According to EPA, these new nonroad standards will result in a reduction in VOC emissions of 13.1% in 1997, 19.5% in 1998 and 23.9% in 1999, on a national basis. Phase II of the federal small nonroad engine standards begins in 2002 and will provide additional emissions reductions. However, the VOC portion of these additional reductions is uncertain, but are presumed to be insufficient to serve as an alternative to an OFRFG regulation.

#### **5.3.2.2. Aircraft**

Aircraft were responsible for an estimated 0.386 tpswd of emissions in New Hampshire in 1996. Prior to 1997, federal regulations on aircraft were limited to smoke and fuel venting emissions standards for all commercial jet aircraft classes. EPA also had hydrocarbon (HC) emission standards for newly manufactured aircraft gas turbine engines (TF, T3, and T8) with a thrust greater than 26.7kN. Separate HC emission standards exist for gas turbine engines employed in supersonic aircraft, and the smoke standards vary for the several different classes of engines. EPA regulations for smoke and VOC emissions have been in effect since 1984. In 1997, EPA promulgated regulations establishing NO<sub>x</sub> and CO emission standards for commercial aircraft engines. This rulemaking affects only NO<sub>x</sub> and CO emissions, and is therefore not a practicable alternative to an OFRFG regulation for achieving VOC reductions.

#### **5.3.2.3. Locomotives**

This source category generated emissions of only 0.004 tpswd in New Hampshire in 1996. The 1990 Clean Air Act Amendments mandated EPA to establish emission standards for a variety of previously unregulated nonroad mobile sources. Included in those requirements was a specific mandate to regulate emissions from locomotives. This rulemaking, which took effect in 2000, will affect railroads, locomotive manufacturers, and locomotive remanufacturers. This rulemaking does not provide a practicable alternative to an OFRFG regulation.

**TABLE 5.1 - Review of Point Source VOC Inventories in the  
 Four-County Area**

<b>A. Point Source Category (Section 5.1)</b>	<b>1990 VOC (tpswd)</b>	<b>1993 VOC (tpswd)</b>	<b>1996 VOC (tpswd)</b>	<b>Currently Controlled?</b>	<b>Potential for Additional Reductions?</b>	<b>Estimated Potential Additional 2002 Reductions* (tpswd)</b>	<b>Practical Option(s) for 2002?</b>
1. Point Inventory	15.198	5.411	10.221	Yes	Yes	0.057	No
2. POTWs	0.292	0.296	0.306	No	Yes	0.241	No
3. TSDFs	n/a	n/a	n/a	n/a	n/a	n/a	No
4. Landfills	1.074	1.084	1.183	No	Yes	<0.23	No

\* See Appendix for calculations

**TABLE 5.2 - Review of Area Source VOC Inventories (Part 1)  
in the Four-County Area**

Area Source Category (Section 5.2)	1990 VOC (tpswd)	1993 VOC (tpswd)	1996 VOC (tpswd)	Currently Controlled?	Potential for Additional Reductions?	Estimated Potential Additional 2002 Reductions* (tpswd)	Practical Option(s) for 2002?
5.2.1 Gasoline/Fuel Dist.							
1. Tank Truck Unloading	6.608	4.937	1.431	Yes	No	--	No
2. Vehicle Refueling	7.303	5.361	1.669	Yes	Yes	0.038	No
3. Underground Tank Breathing	0.578	0.552	0.148	Yes	Yes	0.229	No
4. LUSTs	0.036	0.036	0.036	Yes	No	--	No
5. Tank Trucks in Transit	0.053	0.363	0.203	Yes	No	--	No
6. Petroleum Vessel Load/Unload	n/a	n/a	n/a	No	No		No
7. Aircraft Refueling	n/a	n/a	n/a	No	No	--	No
5.2.2. Stationary Fuel Use (commercial/residential)	0.124	0.090	0.096	No	No	--	No
5.2.3. Open Burning/On- Site Incineration	1.216	1.229	1.274	Limited	No	--	No
5.2.4. Catastrophic/ Accidental Releases							
1. Oil Spills	n/a	n/a	n/a	No	No	--	No
2. Rail Car, Truck, and Other Accidents	n/a	n/a	n/a	n/a	No	--	No

*Continued on next page...*

\* See Appendix for calculations.

**TABLE 5.2 (cont'd.) - Review of Area Source VOC Inventories (Part 2)  
in the Four-County Area**

Area Source Category (Section 5.2)	1990 VOC (tpswd)	1993 VOC (tpswd)	1996 VOC (tpswd)	Currently Controlled	Potential for Additional reductions?	Estimated Potential Additional 2002 Reductions* (tpswd)	Practical Options for 2002?
5.2.5 Stationary Area Source Solvent Use							
1. Dry Cleaning	n/a	N/a	n/a	No	No	--	No
2. Surface Cleaning	5.855	5.641	4.676	Yes	Yes	5.266	No
3. Surface Coating (Total)	13.317	14.457	11.253	Yes	Yes	1.347	No
4. Total Architectural (including traffic markings)	7.885	7.435	6.163	Yes	Yes	0.694	No
1. Auto Refinishing	4.304	4.528	2.592	Yes	Yes	**	No No
2. Small Industrial	1.128	2.494	2.498	Yes	Yes	**	No
3. Graphic Arts	1.436	1.914	1.983	Yes	Yes	1.563	No
4. Asphalt Paving	0.024	0.005	0.005	Yes	No	--	
5. Pesticide Application	1.070	0.815	0.696	No	Yes	0.392	No
6. Consumer/Commercial Solvent Use	6.957	7.066	6.414	Yes	Yes	1.770	No
5.2.6. Bioprocess Emissions Sources							
1. Bakeries	0.039	0.040	0.041	No	Yes	<0.064	No
5.2.7. Other Stationary Area Sources							
1. Forest Fires	n/a	N/a	n/a	No	No	--	No
2. Structural Fires	0.113	0.094	0.115	Yes	No	--	No

\* See Appendix for calculations.

\*\* Additional reductions included in total for architectural coatings.



**TABLE 5.3 - Review of Mobile and Biogenic Source VOC Inventories in  
the Four-County Area**

<b>Mobile Source Category (Section 5.3)</b>	<b>1990 VOC (tpswd)</b>	<b>1993 VOC (tpswd)</b>	<b>1996 VOC (tpswd)</b>	<b>Currently Controlled?</b>	<b>Potential for Additional Reductions?</b>	<b>Estimated Potential Additional 2002 Reductions* (tpswd)</b>	<b>Practical Option(s) for 2002?</b>
5.3.1. Highway Mobile Sources <sup>29</sup>	74.100	58.831	44.890	Yes	No	--	No
5.3.2. Non-Highway Mobile Sources	--	--	--	--	--	--	--
1. Nonroad ( <i>Total 2,4-stroke, diesel, - includes construction and marine equip.</i> )	13.936	15.414	15.970	No	No	--	No
2. 2-Stroke Engines	7.457	9.402	9.742	No	No	--	No
3. 4-Stroke Engines	6.012	5.138	5.323	No	No	--	No
4. Diesel	0.468	0.874	0.906	No	No	--	No
5.3.3. Aircraft	3.739	0.478	0.386	No	No	--	No
5.3.4. Locomotive	0.002	0.011	0.004	No	No	--	No
<b>Biogenic Sources</b>	562.06	562.06	562.06	n/a	No	--	--
<b>Total NH Anthropogenic VOC Emissions</b>	160.96	131.56	109.16	--	--	11.89	--
<b>Percent Anthropogenic (%)</b>	22%	19%	16%	--	--	--	--

\* See Appendix for calculations.

<sup>29</sup> The VOC reductions that were realized in New Hampshire between 1990 and 1996 are the result of new vehicle standards (i.e., Tier 1 federal standards (1994), New Hampshire's participation in the NLEV program, federal RFG, and New Hampshire's Enhanced Safety Inspection Program). New Hampshire is pursuing relief from CAA Section 211(c)(4)(A) via this submittal, to allow for its OFRFG rule to replace federal RFG as a VOC control strategy. Additional reductions are possible from the on-highway mobile source sector with enhanced vehicle I/M. However, as discussed in Section 5.3.1.1, the State's Legislature has preempted the implementation of any enhanced I/M other than the State's Enhanced Safety Inspection Program.

## 6. CONCLUSIONS

DES utilized its 1996 emissions inventory and source categories to determine whether there are any practicable and reasonable alternatives to the adoption of the New Hampshire OFRFG rule when the state opts out of the Federal RFG gasoline program in Hillsborough, Merrimack, Rockingham, and Strafford counties. DES reviewed all point, area and mobile source emission categories, and analyzed each for potential additional reductions using the EPA Region I Staff Paper *"Possible Additional Control Measures to Help the New England States Reach Attainment"* (1997) and the STAPPA/ALAPCO report *"Meeting the 15-Percent Rate of Progress Requirement Under the Clean Air Act: A Menu of Options."*

DES identified the potential for additional emission reductions from several source categories and strategies, including the expansion of Stage II vapor recovery requirements; more stringent AIM, consumer products and autobody refinishing emission limits and reducing the major source and Env-A 1204.05 non-CTG VOC RACT applicability thresholds. All of these would require additional study to better quantify the extent of the potential emission reductions; the cost to the regulated community, consumers and the State; cost-effectiveness; and supply and public acceptance issues. None of these potential strategies could be implemented before the 2002 ozone season, and those requiring the installation of emission controls would require an even longer period of time before reducing emissions. **Even assuming that all of the possible emission reductions discussed above could be made before the 2002 ozone season, only about 80% of the 15 tpswd from the federal RFG program could be made-up without a fuel measure alternative.**

Monitored air quality has improved in New Hampshire's ozone nonattainment areas (the four-county area) since the implementation of programs under the CAA. Based on 1998, 1999, 2000, and 2001 monitoring data, all monitors within New Hampshire showed attainment of the one-hour and the eight-hour national ambient air quality standards for ozone. The Southern NH Serious Nonattainment Area is considered to be in monitored nonattainment, however, because it is part of the Boston-Salem-Lawrence Consolidated Metropolitan Statistical Area (CMSA). This CMSA includes monitors in southeastern Massachusetts that experienced violations of the NAAQS for ozone during the 1999-2001 time frame, violations unrelated to New Hampshire emissions. However, it is clear given the progressive improvement in monitored air quality in New Hampshire that a fuel control measure has and will play a significant role in providing the reductions necessary for the state to achieve attainment. All programs that contribute to attainment in the four-county area remain in place, including reformulated gasoline. However, since RFG is no longer an option in New Hampshire under orders of the Governor and Legislature, DES has determined that an OFRFG rule is the only reasonable and practical measure the State can take to attain and maintain the ozone standard. As a result, the State hereby requests EPA's expeditious approval of this waiver request, enabling New Hampshire to legally enforce its OFRFG rule.

# APPENDIX

## Estimation Methodologies for Calculating Additional Reductions

### **POINT SOURCES (see Table 5.1)**

\* - A 2% annual growth factor has been applied to grow 1996 emissions throughout this appendix to 2002 (a 1.1261 multiplier).

#### **A.1. Inventoried Point Sources (see section 5.1.1):**

##### Reducing non-CTG VOC RACT source threshold to 10 tons per year (actual)

Reducing the non-CTG VOC RACT threshold to 10 tons per year (actual) would impose control requirements on an additional 3 sources:

Source Name	1996 (tpy)	New Limit (tpy)
Avilite Corp	20.7	10
Peterboro Basket Co.	36.7	10
Boyce Highlands	34.2	10

These 3 sources accounted for 91.6 tpy in 1996 (0.251 tpswd). DES estimates that these sources could reduce VOC emissions by an additional 20% through the application of non-CTG VOC RACT:

$$0.20 \times 0.251 \text{ tpswd} \times 1.1261^*(\text{growth multiplier}) = 0.057 \text{ tpswd (reduced)}$$

Therefore, reducing the non-CTG VOC RACT source threshold to 10 tons per year would provide an additional 0.057 tpswd in emission reductions in 2002.

#### **A.2. Publicly Owned Treatment Works (POTWs) (see section 5.1.2)**

##### Application of controls on POTWs

The range of potential reductions from the application of emission controls on POTWs range from 50 to 90% according to a STAPPA/ALAPCO report (*"Meeting the 15-percent Rate of Progress Requirement Under the Clean Air Act: A Menu of Options."*) Assuming an average reduction as the mid-point of this range (70%), additional reductions of 0.241 tpswd are possible for 2002.

$$0.70 \times 0.306 \text{ tpswd} \times 1.1261^*(\text{growth multiplier}) = 0.241 \text{ tpswd (reduced)}$$

## **AREA SOURCES (see Table 5.2)**

### **A.3. Vehicle Refueling (see section 5.2.1.2)**

#### **Increase Stage II requirements to all refueling stations regardless of fuel throughput**

DES estimates that about 84% of all fuel dispensed in the four southeastern counties is done through Stage II emissions controlled equipment (stations with greater than 420,000 gallons dispensed per year). Removing the minimum throughput for requiring Stage II controls provides an additional reduction of 0.038 tpswd.

$$\begin{aligned}(0.16) (433,723,000 \text{ gal}) &= 63,395,680 \text{ gallons dispensed through Stage II equipment} \\ \frac{16\% \text{ (of throughput uncontrolled)}}{(3.61 \text{ g/gal (w/o Stage II)} - 0.77 \text{ g/gal (w/ Stage II)})} &= \frac{100\% \text{ (of throughput)}}{X} \\ X &= 0.178 \text{ g/gal} \\ (0.178 \text{ g/gal}) (69,395,680 \text{ gal/yr}) (1.1261 * (\text{growth multiplier})) &= 13.91 \text{ tons/yr} \\ &= 0.038 \text{ tpswd reduced}\end{aligned}$$

### **A.4. Underground Tank Breathing (see section 5.2.1.3)**

#### **Installation of pressure valve (P-V) vents**

Installing P-V vents that are assumed to have a 100% control effectiveness would reduce all remaining emissions from this category.

$$(1.0) (0.203 \text{ tpswd}) (1.1261 * (\text{growth multiplier})) = 0.229 \text{ tpswd (reduced)}$$

### **A.5. Surface Cleaning (see section 5.2.5.2)**

Prohibiting the use of non-aqueous cleaning agents would eliminate all this category's emissions. They are currently controlled at a

$$(1.0) (4.676 \text{ tpswd}) (1.1261 * (\text{growth multiplier})) = 45,266 \text{ tpswd (reduced)}$$

### **A.6. Surface Coatings (see section 5.2.5.3)**

#### **Option to further controls on auto refinishing operations**

1. Low-VOC surface cleaners and solvents.

According to the STAPPA/ALAPCO publication, "Meeting the 15-Percent Rate of Progress Requirement Under the Clean Air Act: A menu of Options," surface cleaners and cleanup solvents currently have average VOC emissions of 6.75 lbs/gal, and are responsible for approximately 26.3% of all auto refinishing emissions. These products

are not regulated by the federal auto refinishing rule, but are regulated by the South Coast Air Management District (SCAQMD) which currently limits their VOC content to 0.58 lbs/gal. Surface cleaners and cleanup solvents were responsible for 0.682 tpswd of this categories 2.592 tpswd emissions:

$$(0.263) (2.592 \text{ tpswd}) = 0.682 \text{ tpswd}$$

Potential benefits of SCAQMD VOC limits:

$$\frac{0.58 \text{ lbs/gal (SCAQMD limit)} (0.682 \text{ tpswd})}{6.75 \text{ lbs/gal (current content)}} = 0.059 \text{ tpswd}$$

$$\text{or } (0.623 \text{ tpswd}) (1.1261 * (\text{growth multiplier})) = 0.702 \text{ tpswd (reduced)}$$

2. High efficiency application equipment.

The Bay Air Quality Management District (BAQMD) estimated that high volume low pressure spray equipment (HVLP) reduced coatings emissions by 20 to 40%.

Using the mid-point of the estimate (30%):

Estimating emissions due to coatings only under federal emission limits:

$$2.592 \text{ tpswd} - 0.682 \text{ tpswd} = 1.91 \text{ tpswd}$$

$$(0.30) (1.91 \text{ tpswd}) (1.1261 * (\text{growth multiplier})) = 0.645 \text{ tpswd (reduced) from HVLP}$$

Combined benefit of SCAQMD VOC content limits and BAQMD HVLP application equipment to New Hampshire surface coating operations is 1.347 tpswd.

Option to further controls on architectural, industrial, and maintenance coatings

SCAQMD limits the VOC content of architectural, industrial, and maintenance coatings to 28%. Adopting this limit:

$$0.28 \times 7.703^{30} \text{ tpswd} = 2.157 \text{ tpswd}$$

Currently the federal AIM rule (20% reduction) is applied in New Hampshire:

$$0.20 \times 7.703 \text{ tpswd} = 1.541 \text{ tpswd}$$

$$\text{Net benefit: } (2.157 - 1.541) \times 1.1261 * (\text{growth multiplier}) = 0.694 \text{ tpswd (reduced)}$$

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<sup>30</sup> Emission factor of 5.1 lbs/capita, before 20% federal AIM reduction was applied to the 1996 nonattainment area population of 848,154 over 365 operational days per year. A summer adjustment factor of 1.3 was used to arrive at 7.703 tpswd.

**A.7. Graphic Arts (see section 5.2.5.4)**

Requiring all graphic arts processes to install add-on control equipment or use low-VOC inks

DES estimates that these measures would provide about a 70% reduction in emissions.

$$(0.70) (1.983 \text{ tpswd}) (1.1261 * (\text{growth multiplier})) = 1.563 \text{ tpswd (reduced)}$$

**A.8. Pesticide Application (see section 5.2.5.6)**

DES estimates that a reduction of up to 50% of VOC emissions from pesticide application is possible by using a lower VOC solvent base.

$$(0.50) (0.696 \text{ tpswd}) = 0.348 \text{ tpswd (reduced)}$$

**A.9. Commercial and Consumer Solvent Use (see section 5.2.5.7)**

Adopt current California VOC limits on consumer products

Adopting California limits would regulate an additional 7 product categories, providing an additional 28% VOC reduction.

$$(0.28) (6.414 \text{ tpswd}) = 1.796 \text{ tpswd (reduced)}$$

From this, the benefits of the federal program are subtracted from the entire category.

$$(1.796 \text{ tpswd} - (0.125 \times 1.796 \text{ tpswd})) \times 1.1261 * (\text{growth multiplier}) = 1.770 \text{ tpswd (reduced)}$$

**A.10. Bakeries (see section 5.2.6.1)**

Any potential reductions from this category would be minimal ( $< 0.064$  tpswd).

$$(0.057 \text{ tpswd}) (1.1261 * (\text{growth multiplier})) = 0.064 \text{ tpswd (reduced)}$$